

Factors Affecting the Earnings Response Coefficient: An Empirical study for Iran

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Abstract

The overall goal of this research is to identify the factors that influence earnings response coefficient. The data were gathered using library and corporate documents methods. Thus the dependent variable in this study is the earning response coefficient which was tested based on the market response to the unexpected parts of profit coefficient and the market response to the profit changes coefficient models. Then in order to test the hypotheses, one of the proposed models which had a higher explanatory power was chosen. A total sample of 202 companies listed in Tehran Stock Exchange for the period of 7 years (the years 2006 to 2012) was studied in order to perform the analysis and hypotheses testing. In this research, the combined regression model was used to investigate the research hypotheses. The results of this study suggests that the earning response coefficient has a positive and direct relationship with the quality of earnings, growth opportunities and profitability, a negative and inverse relationship with systematic risk and no relationship with financial leverage.

Keywords: Earning Response Coefficient, Financial Leverage, Growth Opportunities, Systemic Risk, Profitability

Introduction

In capital markets, investment decisions are made based on information that is presented to the market in different ways. However, there are some conditions in financial reporting environment which makes it difficult for users to assess the quality of information directly; among them are the conflict of interests, important economic consequences, information complexity and the lack of direct access to the data (Nikkhah & Mojtahedzade, 1999). Stock price changes and response at the time of prediction presentations depends on the type of predictions and adjustments which is exposed by the management during the fiscal year in order to fulfill the investors' expectations (King et al. 1990)¹.

The main question of this research is whether the quality of earnings, financial leverage, growth opportunities, systematic risk and profitability are the influential factors on the earning response coefficient? Which one of the market response to the unexpected parts of profit coefficient model and the market response to the profit changes coefficient model has a higher explanatory power?

The following hypotheses are proposed according to the research question:

Hypothesis 1: There is a significant relationship between earnings quality and earnings response coefficients.

Hypothesis 2: There is a significant relationship between financial leverage and earnings response coefficients.

¹ King, R., G. Pownall, And G. Waymir

Hypothesis 3: There is a significant relationship between growth opportunities and earnings response coefficients.

Hypothesis 4: There is a significant relationship between profitability and earnings response coefficients.

Hypothesis 5: There is a significant relationship between systematic risk and earnings response coefficients.

When a person has decided to invest, the first issue that he will face is the choice of the desired stock. Investors in Tehran Stock Exchange and small Investors in particular, attempt to make decisions based on unofficial and incorrect information that lead to their loss and eventually become discouraged and withdraw from the capital market. Therefore, Exchange administrators need tools such as stock price changes roof for a day to support the rights of shareholders, especially the smaller shareholders. As for the informing process, the information must be delivered to the investors accurately and in time. Accordingly, the accounting information should help investors to predict future events. Most investors are looking to maximize the return on their investment. Therefore, recognizing the correct time to buy, sell or keep the stock will enable them to reach their goal of maximizing the return on their investment (Pishgooii, 2011).

The overall goal of this research is to identify the factors that influence earnings response coefficient. Thus the dependent variable in this study is the earning response coefficient which is tested based on the market response to the unexpected parts of profit coefficient and the market response to the profit changes coefficient models. Then in order to test the hypotheses, one of the proposed models which has a higher explanatory power is chosen.

Background Research

The theoretical background

Why does market reacts differently towards the good or bad news of different companies? If the answer to this question can be found, accountants can improve their understanding of how accounting information can be useful for investors.

This could initially move towards the preparation of very useful financial information. As a result, identifying and describing the different market reactions to earnings information is one of the most important guides of the empirical financial accounting researches since the Ball and Brown study. This is called the earnings response coefficient. Earnings response coefficient measures the unexpected return of the market in response to the unexpected parts of the reported earnings of the company that has issued the securities.

Experimental background

Despite trying to find some records that may be associated specifically with the purpose of the present study, such records could not be found. However, the following seems to be related to this research to some extents:

Kormendi and Lipe performed a research in 1987 called profitability, sustainable profit and stock returns. Continued profitability was identified in their investigation as the primary factor affecting earnings response coefficient (Kormendi, R. and R. Lipe, 1987, p340).

Collins and Kothari performed a study in 1989 called an analysis of international and cross-sectional determinants of earnings response coefficient. They concluded that systemic risk is the only factor negatively affecting the earnings response coefficient and the growth opportunities factor has a positive influence on earnings response coefficient (Collins, and Kothari S.P, 1989, p49).

Easton and Zmijewski investigated the cross-sectional variation in the stock market response to accounting earnings announcements in their research in 1989. They concluded that after

controlling the risk and growth variables, continuing the profit trend is an influential factor on the earning response coefficient (Easton, and Zmijewski, 1989, p31).

Lee and Fargher investigated the association between unexpected earnings and abnormal security returns in the presence of financial leverage in 1991. They concluded that earnings response coefficients for the firms without leverage or the firms with lower levels of leverage is higher than the firms with leverage or the firms with higher levels of leverage (K.Lee and N.Fargher, 1991, p22).

Maurice Fugers examined the factors affecting the earnings association coefficient (case study for the UK) in 2007. The results showed that the relationship between the earnings association coefficient and cash flow to accrual ratio is positive, the relationship between the earnings association coefficient and total debt to book value of equity ratio is negative, the relationship between the earnings association coefficient and market value of equity to book value of equity ratio is positive, the relationship between the earnings association coefficient and profitability is positive and the relationship between the earnings association coefficient and systematic risk is negative. Furthermore, the results showed that levels in earnings may have higher explanatory power on security returns than changes in earnings. (Fugers, Maurice, 2007).

Khoshtinat and Fallah investigated the effect of financial leverage on the earnings response coefficient in 2006. The results showed that in the first definition of financial leverage and in the low level of leverage, there is no relationship between financial leverage and earnings response coefficient. In the total sample and the high level of leverage, it was observed that financial leverage negatively affect the earnings response coefficient. In the second definition of leverage, in the total sample and a low level of leverage there is no relationship between financial leverage and earnings response coefficient, but in the high level of leverage there is a weak association between financial leverage and earning response coefficient (Khoshtinat and Fallah, 2006).

Conceptual and operational definitions of the research variables

The dependent variable in this study is earnings response coefficient and the independent variables are the influencing factors on earnings response coefficient (cash flow to accrual ratio, total debt to book value of equity ratio, market value of equity to book value of equity ratio, profitability and the systematic risk).

Earning response coefficient: The dependent variable in this study is the earning response coefficient which was tested based on the market response to the unexpected parts of profit coefficient and the market response to the profit changes coefficient models. Then in order to test the hypotheses, one of the proposed models which has a higher explanatory power was chosen. Earnings quality: The concept of earning quality points to the profitability in decision making and the relationship between profit quality and economic profit features (Mc Nichals, M. 2002). Operating profit to cash flow from operating activities was used in this study in order to calculate the earnings quality.

Financial leverage: the leverage has been defined in financial researches as to the amount of debt taken in order to finance the required resources for gaining the needed assets (Sinai and Rezaei, 2005). Total debts to total assets ratio (balance sheet approach) has been used in this study in order to calculate the financial leverage.

Growth of the company: the company's ability to identify potential funding sources (either internal or external) for making capital investments and to provide appropriate financial plans is considered as one of the main factors of growth and development of a company (Samadi, Soheili, Kabiri pour, 2013). Market value of equity to book value of equity ratio has been used in this study in order to calculate the company's growth.

Profitability: Profitability refers to the company's ability to earn profits. Profitability is the final result of the company's programs and financial decisions.

Operational assets to equity ratio has been used in this study in order to calculate the profitability.

Systematic Risk (Beta Coefficient): Systematic risk is the non-removable part of the total risk of the portfolio and it is due to factors that affect the total price of securities (Mohammadi, 2010, p71).

The stock price index has been used in this study in order to calculate the systematic risk.

Operational definition of intervening variables

Analytical models' sensitivity has been increased with the addition of firm size as an intervening variables, therefore the research's analytical model does not deal with the issue of omitted variables correlation. Natural logarithm of the market value of equity for each company was used in order to calculate the size of the firm.

Research Method

Design of the study

Regarding the purpose of study, this research is an applied research. The purpose of applied research is the development of applied knowledge in a particular field and its practical application. The method of the research is the regression and correlation type of descriptive research. This study uses historical data to test the hypotheses and it is an Ex-Post Facto research.

Statistical population

Statistical population of the research, as mentioned earlier, is the listed companies on the Tehran Stock Exchange. The research sampling is purposeful, which means that the population has been screened by considering some conditions, and the companies which comply with the requirements based on the systematic elimination method were analyzed as the research statistical samples.

The followings are the selection conditions for the statistical samples:

1. The company should be listed in Tehran Stock Exchange before 2006 and its share should be traded on an exchange by the beginning of 2006.
2. Firms should not have changed their fiscal year during the research period.
3. The financial statements and accompanying explanatory notes should be accessible.

Data Analysis

After practicing the market response to the unexpected parts of profit coefficient and the market response to the profit changes coefficient models, the market response to the profit changes coefficient model has been used in this research for measuring the earning response coefficient and hypotheses testing since its explanatory power (31 percent) is higher than the explanatory power of the unexpected profit model (7 percent). Therefore, the hypotheses testing models are as shown in Table 1.

The analysis of correlation and multicollinearity between the research variables

According to the Spearman correlation coefficients in Table 1, there is a significant correlation between paired variables and it is to a degree that will lead to the multicollinearity and the regression models will face a trouble. This means it is impossible to investigate the research model with the simultaneous presence of all the explanatory variables and in order to test the research hypotheses, each one must be separately entered into the regression model.

Table 1. Matrix of correlation coefficients between explanatory variables of the research

Variable	Return	Earning Changes	Earning Changes multiplied by Earning Quality	Earning Changes multiplied by Financial Leverage	Earning Changes multiplied by Growth Opportunities	Earning Changes multiplied by Profitability	Earning Changes multiplied by Systematic Risk	Firm's Size
Return	1 -							
Earning Changes	0.031 0.024	1 -						
Earning Changes multiplied by Earning Quality	0.181 0.000	0.076 0.051	1 -					
Earning Changes multiplied by Financial Leverage	- 0.179 0.461	0.060 0.122	0.957 0.000	1 -				
Earning Changes multiplied by Growth Opportunities	0.183 0.000	0.063 0.105	0.957 0.000	0.980 0.000	1 -			
Earning Changes multiplied by Profitability	0.137 0.000	0.031 0.422	0.901 0.000	0.925 0.000	0.930 0.000	1 -		
Earning Changes multiplied by Systematic Risk	- 0.124 0.001	0.027- 0.479	0.426 0.000	0.440 0.000	0.454 0.000	0.430 0.000	1 -	
Firm's Size	0.098 0.012	0.120 0.002	0.076 0.049	0.083 0.033	0.089 0.022	0.026 0.496	0.068 0.077	1 -

Research findings

First hypothesis: There is a significant relationship between earnings quality and earnings response coefficient.

Observations from investigating the above model according to the t-statistic and its probability suggest a significant earning changes multiplied by earning quality impact coefficient (statistic possibility is lower than the 5% margin of error). Since the coefficient is positive, evidence suggest a significant and positive impact of earnings quality on earnings response coefficient. Table 2 shows the results of the first hypothesis test.

Table 2. First hypothesis testing

Experimental Variables	Coefficients	t	Probability
Y-intercept	-2.956585	-5.333332	0.000
Earning Changes	3.899370	2.422789	0.000
Earning Changes multiplied by Earning Quality	1.517426	5.620007	0.015
Firm's Size	0.605632	15.62382	0.000

Second hypothesis: There is a significant relationship between financial leverage and earnings response coefficients.

Observations from investigating the above model according to the t-statistic and its probability suggest no significant earning changes multiplied by financial leverage impact coefficient (statistic possibility is lower than the 5% margin of error). This means that by increasing (or decreasing) the financial leverage, the relationship between changes in dividends and annual stock returns remains unaffected. Table 3 shows the results of the second hypothesis test.

Table 3. Second hypothesis testing

Experimental Variables	Coefficients	T	Probability
Y-intercept	-3.0900835	-7.378691	0.000
Earning Changes	4.169375	6.456333	0.000
Earning Changes multiplied by Financial Leverage	-7.694885	-1.428817	0.153
Firm's Size	0.578798	7.704458	0.000

Third hypothesis: There is a significant relationship between growth opportunities and earnings response coefficients.

Observations from investigating the above model according to the t-statistic and its probability suggest a significant earning changes multiplied by growth opportunities impact coefficient (statistic possibility is lower than the 5% margin of error). Since the coefficient is positive, evidence suggest a significant and positive impact of growth opportunities on earnings response coefficient. Table 4 shows the results of the third hypothesis test.

Fourth hypothesis: There is a significant relationship between profitability and earnings response coefficients.

Observations from investigating the above model according to the t-statistic and its probability suggest a significant earning changes multiplied by profitability impact coefficient (statistic possibility is lower than the 5% margin of error). Since the coefficient is positive, evidence suggest a significant and positive impact of profitability on earnings response coefficient. Table 5 shows the results of the fourth hypothesis test.

Table 4. Third hypothesis testing

Experimental Variables	Coefficients	t	Probability
Y-intercept	-2.017025	-3.091432	0.002
Earning Changes	7.253451	2.046595	0.041
Earning Changes multiplied by Growth Opportunities	2.326340	3.534027	0.000
Firm's Size	0.4003663	3.507497	0.000

Table 5. Fourth hypothesis test

Experimental Variables	Coefficients	T	Probability
Y-intercept	-3.214073	-14.75597	0.000
Earning Changes	4.658584	4.916776	0.000
Earning Changes multiplied by Profitability	7.541221	3.166603	0.001
Firm's Size	0.609596	15.66210	0.000

Fifth hypothesis: There is a significant relationship between systematic risk and earnings response coefficients.

Observations from investigating the above model according to the t-statistic and its probability suggest a significant earning changes multiplied by systematic risk impact coefficient (statistic possibility is lower than the 5% margin of error). Since the coefficient is negative, evidence suggest a significant and negative impact of systematic risk on earnings response coefficient. Table 6 shows the results of the fifth hypothesis test.

Table 6- Fifth hypothesis test

Experimental Variables	Coefficients	T	Probability
Y-intercept	-3.015555	-13.91922	0.000
Earning Changes	3.721627	3.920999	0.000
Earning Changes multiplied by Systematic Risk	-4.499689	-4.387662	0.000
Firm's Size	0.573183	14.84945	0.000

Conclusions

According to the research hypotheses test model, the followings were observed:

There is a significant relationship between earnings quality and earnings response coefficient. This means that by increasing (or decreasing) the earnings quality, the relationship between changes in dividends and annual stock returns strengthens (weakens). Theoretically, this result is consistent with the conceptual framework of earnings response coefficient. Based on the conceptual framework, it was expected that the higher earnings quality is, the higher earnings response coefficient will be. Because investors can better recognize the future performance of the company using current performance. Therefore, the first hypothesis is accepted. Test result is consistent with the researches of Lev and Thiagarajan (1993) and Ahmadpoor (2008).

There is no significant relationship between financial leverage and earnings response coefficient. This means that by increasing (or decreasing) the financial leverage, the relationship between changes in dividends and annual stock returns remains intact. Theoretically, this result is in contrast to the conceptual framework of earnings response coefficient. Based on the conceptual framework, it was expected that for the companies with high leverage (loan), an increase in net income (more than the interest) will result in a stronger and safer securities and other debts in a way that the bondholders will welcome the good news about the net income. Therefore the response to net income coefficient for the companies with substantial loans will result in a drop in their income response coefficient in comparison with the companies with little or no debts. Therefore, the second hypothesis is declined. Test result is different from Lee and Fargher (1991) and consistent with Khoshtinat and Fallah (2006).

The reasons that can be reported to reject the above hypothesis are as follows:

Much of the listed companies' debts are owed to the group companies and corporates do not assign conditions for such debts because the payer companies assume they are asking themselves, so they won't try hard enough to retake the debt. These debts will be reflected on the balance sheet from year to year, and the investors do not react to it and it ignore it because of the irrelevancy of this information.

Another important reason is that most of the banks in Iran are governmental and most large companies listed in Tehran Stock Exchange see half of their shares in government hands too. Therefore there is a decent relationship between the banks and the companies. The companies can easily borrow the money and the banks are not strict in retaking their loans. Therefore, investors do not react to these debts. Investors react to corporates' financial leverage when it is very hard to get loans from banks and the interest rates are too high.

There is a significant relationship between growth opportunities and earnings response coefficient. This means that by increasing (or decreasing) the growth opportunities, the relationship between changes in dividends and annual stock returns strengthens (weakens). Theoretically, this result is consistent with the conceptual framework of earnings response coefficient. Therefore the third hypothesis is accepted. Test result is consistent with the research of Collins and Kothari (1989).

There is a significant relationship between profitability and earnings response coefficient. This means that by increasing (or decreasing) the profitability, the relationship between changes in dividends and annual stock returns strengthens (weakens). Theoretically, this result is consistent with the conceptual framework of earnings response coefficient. Based on the conceptual framework, it was expected that the higher profitability is, the higher earnings response coefficient will be and vice versa. Therefore, the fourth hypothesis is accepted. Test result is consistent with the researches of Kormendi and Lipe (1987) and Lev and Thiagarajan (1993).

There is a significant relationship between systematic risk and earnings response coefficient. This means that by increasing (or decreasing) the systematic risk, the relationship between changes in dividends and annual stock returns weakens (strengthens). Theoretically, this result is consistent with the conceptual framework of earnings response coefficient. Based on the conceptual framework, it was expected that the riskier the company's expected future return is, the lower its value for a risk taker investor will be. For a diversified investor (portfolio), beta is a benchmark for the calculation of the effective asset. Investor takes the current year profit as a strong indicator of future profitability and return. The riskier the future returns are, the lower investment market reaction to dividend changes would be. A reasonable investor's utility function will increase with the expected value and will decrease according to his portfolio return risk. Therefore, the fifth hypothesis is accepted. Test result is consistent with the research of Collins and Kothari (1989).

Finally the results of the above hypotheses tests showed that there is a direct relationship between the firm's size and their annual stock returns. It means that by increasing (decreasing) the size of the firm, its annual stock returns will increase (decrease). Theoretically, this result is consistent with the conceptual framework. Banz in 1994 suggested that the return of large companies are different than the returns of small companies.

Suggestions for future research and limitation of the study

It is advised to the researchers to consider longer research periods for their future researches and calculate the research variables monthly or weekly when possible.

It is advised to the researchers to consider more factors affecting the earning response coefficient in the hypothesis and test them, thus others can use their results.

Regarding the limitation of the study, it was supposed to consider an eleven year period in order to investigate the factors affecting the earning response coefficient in this research, but a seven year period has been used to test the hypotheses since the required information about the research variables for all those years were not accessible.

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